41546 8710-11-30

NUS CORPORATION AND SUBSIDIARIES — **TELECON NOTE**

CONTROL NO:	DATE:	TIME:
	5/9/88	14:40

ORIGINAL (Red)

DISTRIBUTION: [redacted]

Ludlow Industrial Park
TDD - F3-8710-11

BETWEEN:	OF:	PHONE:
[redacted]	EPA	( )

AND: [redacted]

DISCUSSION:

- I called [redacted] (re) Ludlow Industrial Park. Original request was for resampling of soils in drum storage area after removal action. The request didn't require tox or collection of necessary target, receptor or bkgnd info. However when TDD was typed it required a tox. What is the present situation and his needs regarding the tox.
- [redacted] concurred that the tox was not originally required. He would like the requested resampling report w/in data and NO tox. If a tox is deemed necessary he will request it under a seperate TDD.

ACTION ITEMS:

- process report.
- [redacted] provide necessary changes to TDD requirements.

[redacted]

NUS 067 REVISED 0685

8 710-11-28

415469

ORIGINAL
(Red)

NUS CORPORATION

999 WEST VALLEY ROAD
WAYNE, PENNSYLVANIA 19087
215-687-9510

February 5, 1988
T-585-2-8-26
68-01-7346

[redacted]
U.S. Environmental Protection Agency
841 Chestnut Building
Ninth and Chestnut Streets
Philadelphia, PA 19107

[redacted]

Attached please find a draft copy of the preliminary assessment for Ludlow Industrial Park Drum Site DE-121 TDD No. F3-8710-11

Please endorse below confirming that you have recieved the attached subject data and return the form to the above address.

Sincerely,

[redacted]

Garth Glenn
Regional Operations Manager,
FIT 3

GG/ls

Attachments

Signature: [redacted]

Date: 2/8/88

orig

8/10-11-06

41547

ORIGINAL
(Red)

R-585-12-7-3

SITE VISIT SUMMARY REPORT
FOR
LUDLOW INDUSTRIAL PARK DRUM SITE
PREPARED UNDER

TDD NO. F3-8710-11
EPA NO. DE-121
CONTRACT NO. 68-01-7346

FOR THE

HAZARDOUS SITE CONTROL DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

DECEMBER 3, 1987

NUS CORPORATION
SUPERFUND DIVISION

SUBMITTED BY	REVIEWED BY	APPROVED BY
[redacted]	[redacted]	[redacted]
GEOLOGIST	ENVIRON. SCIENTIST	ASSISTANT MANAGER

1.0 FIELD TRIP REPORT

1.1 Summary

On Thursday, November 12, 1987, NUS FIT 3 personnel Mark Kramer, Sharon Schaeffer, Robert Stroud, Paul Ryan, and James Chambers conducted a site inspection of the Ludlow Industrial Park Drum Site, in Wilmington, New Castle County, Delaware. Permission for site access was granted by Melissa Toms, of Alloy Surfaces Company, which is a subsidiary of RSC Realty, the current site owner. The weather at the time of the inspection was sunny, with temperatures ranging from 40°F to 50°F.

Samples collected included 11 surface soil samples and 6 auger samples, including a blank and a duplicate. Alloy Surfaces requested and received split samples.

FIT 3 was accompanied by Ms. Toms. No state or EPA officials accompanied FIT 3 during the inspection.

Deviations from the Sampling Plan

Samples are not going to be analyzed for nitrates, sulfates, and pH as originally intended.

There were no other deviations from the approved sampling plan.

1.2 Persons Contacted

1.2.1 Prior to Field Trip

Melissa Toms
Site Representative
Alloy Surfaces Company
100 Locke Road
Wilmington, DE 19809
(302) 762-8900

Paul Racette
U.S. EPA
841 Chestnut Building
Ninth and Chestnut Streets
Philadelphia, PA 19107
(215) 597-1073

Dave Difenthaller
Delaware Department of
Natural Resources and
Environmental Control
715 Grantham Lane
New Castle, DE 19720
(302) 323-4544

Joel Karmazyn
U.S. EPA
841 Chestnut Building
Ninth and Chestnut Streets
Philadelphia, PA 19107
(215) 597-0823

Brad Smith
Delaware Department of
Natural Resources and
Environmental Control
715 Grantham Lane
New Castle, DE 19720
(302) 323-4545

Tom Pendergast
Consolidated Rail
15 North 32nd Street
Philadelphia, PA 19107
(215) 977-1685

1.2.2 At the Site

Melissa Toms
Site Representative
Alloy Surfaces Company
100 Locke Road
Wilmington, DE 19809
(302) 762-8900

1.3 Site Observations

- The radiation mini-alert setting was at the X1 position; no readings above background were recorded.

- The HNU background reading was 0.2 ppm; several readings above background were recorded.

- High HNU readings (1,100 ppm) were recorded at sample locations east of the access road and near the sewage system tanks. The high readings were recorded when samplers augered in a clay layer that was four to six inches below the surface.

- Clays were red in color.

- A high HNU reading was recorded at sample location S-5/A-5. This was next to an old broken concrete pad used to support large storage tanks.

- High HNU readings were recorded around the edges of the trap door to the sewage system tanks.

- At sample location S-8, HNU readings of 5 to 7 ppm were recorded.

- Sample location S-8 appeared to be a buried drum or small storage tank. The sample was obtained from soil surrounding the unit.

- Samples S-9 and S-10 were taken near location S-4 in the late afternoon and did not show HNU readings above background.

- The site was heavily vegetated with brush reaching 8 to 10 feet high.

- There were 3 storage cylinders setting on top of a concrete pad near the access road, approximately 200 feet east of the Alloy Surfaces Company building.

- There were piles of brick and concrete rubble located 700 to 800 feet east of the building and within the high weeds.

- The site was completely enclosed by a fence except where bordered by the Delaware River.

- There were two green-colored wet wells that were part of the sewage system located along the eastern border of the access road and approximately 50 feet north of the site's southern border.

- There were no distinct drainage pathways noticed by NUS FIT 3 members.

- There were a few crushed drums located in the weeds and on the adjacent property to the south. All drums appeared damaged and empty.

- The concrete pad located along the southern boundary of the site measured 20 by 100 feet.

- Alloy Surfaces Company workers took colorimetric tube samples from within the sewage system wet well and found the presence of solvents. Samples of the tank were taken by the Eldredge Consulting Firm for analysis.

- The site is bordered on the north, south, and west by industrial complexes and is bound on the east by the Delaware River.

- The site and the surrounding area rely upon a municipal system for their water supply.

- There were no stained soils or stressed vegetation noticed throughout the site.

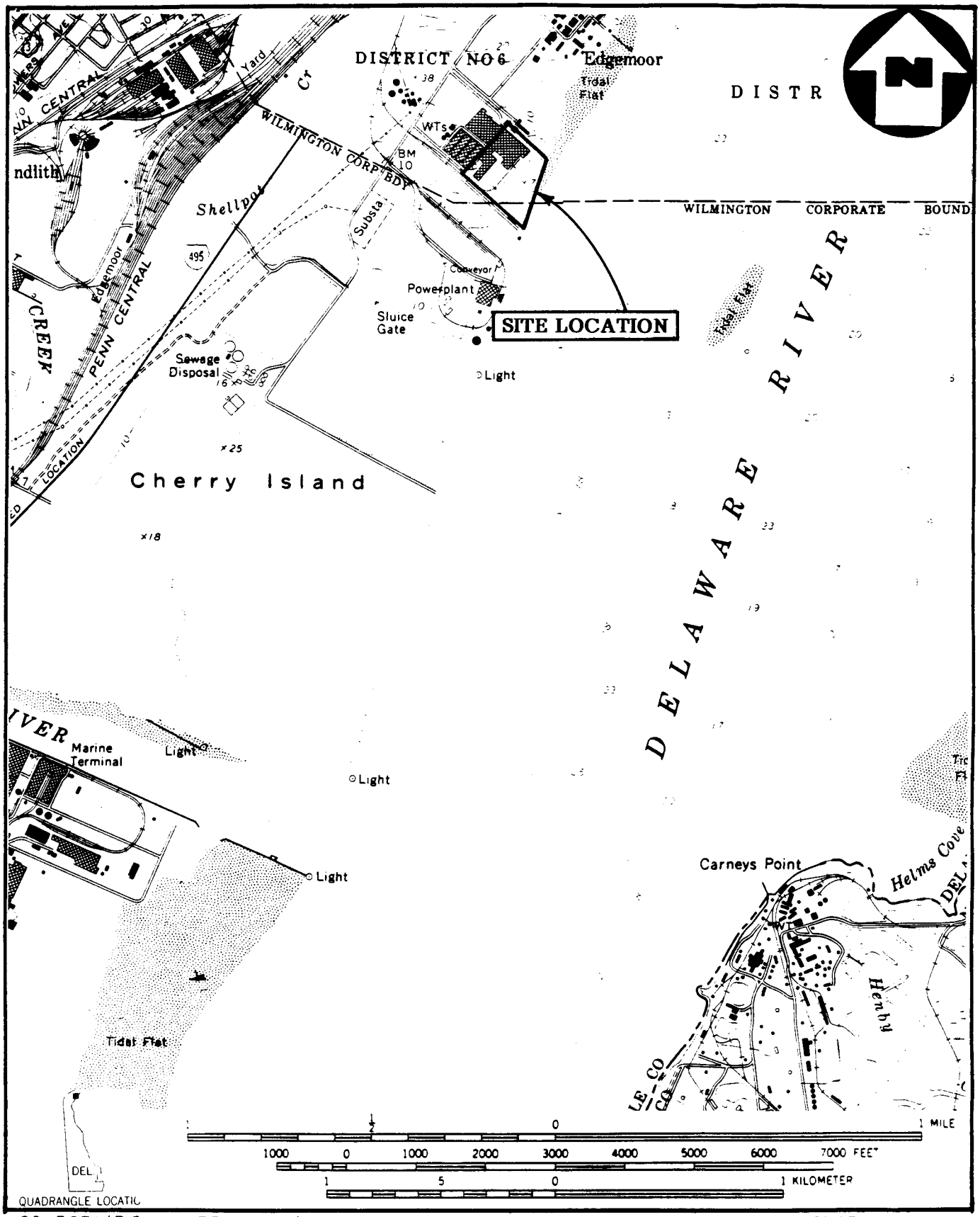
- Other buildings on the RSC Realty/Alloy Surfaces property are leased to other businesses.

- Two former drum disposal areas were observed. The first is east of the access road and near the sewage system tanks. The second is on the western side of the road and 40 to 45 feet north of the sewage system tanks.

- The portion of the property owned by ConRail appeared to be free of stressed vegetation. Also, no drums were observed on the ConRail property.

- There was a low-lying area with some pooled water on the ConRail property where drums had been stockpiled prior to removal.

ATTACHMENT 1



SOURCE: (7.5 MINUTE SERIES) U.S.G.S PENNS GROVE & WILMINGTON SOUTH, DEL. - N.J., QUAD.

FIGURE 1

SITE LOCATION MAP

LUDLOW INDUSTRIAL PARK DRUM SITE

SCALE 1: 24000

NUS CORPORATION

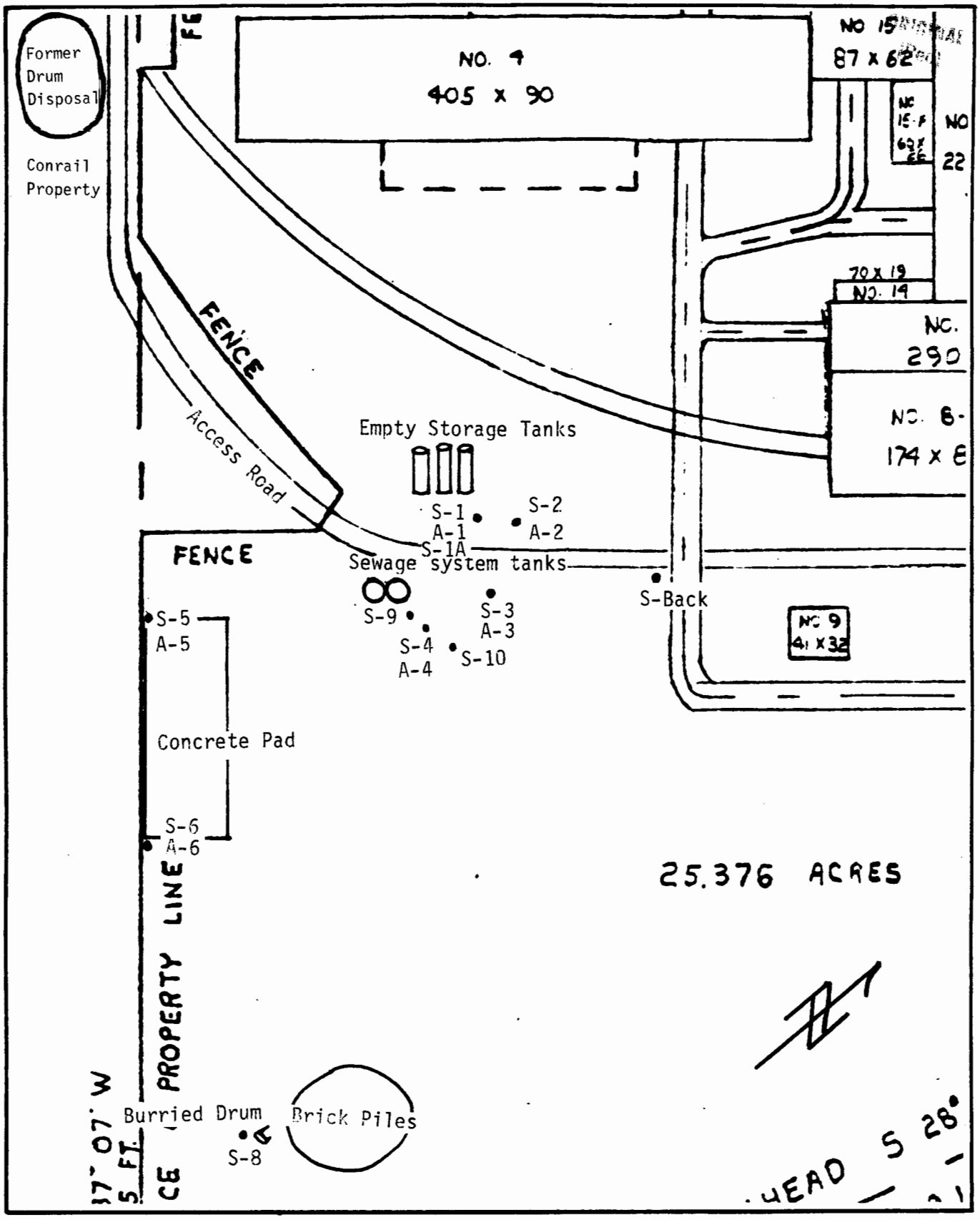


FIGURE 2

SAMPLE LOCATION MAP

LUDLOW INDUSTRIAL PARK DRUM SITE

NUS CORPORATION

A Halliburton Company

ATTACHMENT 2

TDD Number 8710-11
EPA Number DE-121

SAMPLE LOG

Site Name Lorilow Industrial Park Drum Site

TRAFFIC REPORTS			SAMPLING LOCATION	PHASE	SAMPLE DESCRIPTION	DATE	TIME	pH	COMMENTS/OBSERVATIONS	LABORATORY
Organic	Inorganic	High Hazard								
CQ540	MCR326		S-1	SOL	clay rich sediments.	11/12/87	1012			Organics to: Compuchem Laboratories
CQ541	MCR327		S-2		Sand and clay		1110			
CQ542	MCR328		S-3		Sand and clay		1100			
CQ543	MCR329		S-4		Clay layer 6" deep		1240		High HNu reading 1100ppm	Inorganics to: EPS Environmental Protection Systems
CQ544	MCR330		S-5		Sand and clay		1150		slight HNu reading in Auger	
CQ545	MCR331		S-6		Sand and clay		1405			
CQ547	MCR333		S-8		Semi Buried Drum		1410		High HNu reading 5-7ppm	
CQ548	MCR334		S-9		Same area of sample CQ543		1445			
CQ549	MCR335		S-10		Same area of sample CQ543		1450			
CQ550	MCR336		A-1		Red clay and dark brown sands		1037			
CQ551	MCR337		A-2		Sand and Clay		1035			
CQ552	MCR338		A-3		Sand and clay		1114			
CQ553	MCR339		A-4		Augered into clay layer		1200		High HNu readings	
CQ554	MCR340		A-5		Sand + Clay		1300			
CQ555	MCR341		A-6		Sand + Clay		1420			
CQ560	MCR346		S-1A		Duplicate of CQ540		1012			
CQ562	—		S-Blank		HPLC H2O	11/12/87	1037			
CQ563	MCR347		S-Back	V	Background	↓	1000			

8710-11-26

415473

United States Department of the Interior

FISH AND WILDLIFE SERVICE
DIVISION OF ECOLOGICAL SERVICES
1825 VIRGINIA STREET
ANNAPOLIS, MARYLAND 21401

ORIGINAL (Red)

November 25, 1987

[redacted]
NUS Corporation
999 West Valley Road
Wayne, PA 19087

[redacted]

This responds to your November 17, 1987, request for information on the presence of Federally listed endangered or threatened species within the areas affected by three hazardous substance disposal sites in Delaware.

Except for occasional transient individuals, no Federally listed or proposed endangered or threatened species are known to exist in the impact area of the Delaware State College Dump in Kent County.

The Sussex Lumber Company site in Sussex County is within 1/2 mile of a bald eagle nesting site.

The Ludlow Industrial Park in New Castle County is within 1/4 mile of habitat (in the Delaware River) which may be utilized by the shortnose sturgeon (Acipenser brevirostrum).

This response relates only to Federally listed endangered and threatened species. It does not address other concerns under the Fish and Wildlife Coordination Act or other legislation.

If you need further assistance, please contact Andy Moser of our Endangered Species staff at (301) 269-6324.

Sincerely yours,

[redacted]
Supervisor
Annapolis Field Office

TDD No.: 8710-11-05
Site Name: Ludlow Ind. Park Drum Site

415481 ORIGINAL (Red)

SITE SAFETY FOLLOW UP REPORT

Actual Date of Work: 11/12/87

Actual Site Investigation Team:

NUS Personnel:	Responsibilities:
[redacted]	STL / decon.
	Sampler Ass STL / decon.
	Sampler / SO / decon.
	Sampler / Surveillance / decon
	Sampler / decon.

Other:	Purpose:

		Date
Team Leader:	[redacted]	11/17/87
Prepared by:		11/17/87
Reviewed by:		11/20/87
Approved by:		11-30-87

LUDLOW INDUST. DRUM SITE MK

CASE 8466

ORG - COMPUCHEM

INORG - EPS

ORIGINAL (Red)

Personal Protective Equipment

		Safety Plan Requirements	Level Used	If Deviations, explain
Activity: Site Recon	Respiratory Protection	D	D	None.
	Field Dress	W	W	
Activity: Sampling	Respiratory Protection	D	D + B	Upgrade to level "B" because of high HNu reading at sample location
	Field Dress	W	W	
Activity:	Respiratory Protection			
	Field Dress			
Activity:	Respiratory Protection			
	Field Dress			
Activity:	Respiratory Protection			
	Field Dress			

TDD No.: 8710-11
Site Name: Ludlow

MONITORING EQUIPMENT

a. HNU

- Background reading: 0.2 ppm
- Readings above background: yes
- Location of high readings: in former drum storage area southeast of access road, also near former storage tanks, and near brick piles
- What action was taken? evacuate and upgrade to Level "B" to take samples.

b. Radiation

- Readings above background? ____ Yes ✓ No
- If yes, specify where readings were found and what action was taken.

c. Heat Stress/ Cold Stress

Was heat stress or cold stress monitoring performed?

____ Yes ✓ No

Was a monitoring/break schedule followed?

____ Yes ✓ No

If monitoring was not performed, or the monitoring/break schedule was not followed, please explain.

Temperature was about 45° F. No one complained of cold stress.

d. Other Monitoring Instruments

____ Draeger Tube and Pump (specify tube) ____

What readings were found and what action was taken ____

____ Explosimeter/O_2 meter ____

____ Air Sampling

What air sampling equipment was used? ____

TDD No.: 8710-11
Site Name: Lvd low

The media used for sampling included:

_____ Filters (type_____)

_____ Charcoal Tubes/Silica Gel Tubes

_____ Impingers (Liquid Media _____)

_____ Other Media

The air samples taken were _____ environmental

_____ personal

The following team members wore personal sampling pumps.

	Team member	Location of media
1.		
2.		
3.		
4.		
5.		
6.		

TDD No.: 8710-11
Site Name: Ludlow

GENERAL SAFETY

a. Were any safety problems encountered while on site?

Explain: Only when HNu readings above background. Also, needed walkie talkies for sampling in high brush because line of site was impossible.

b. Confined Space Entry

(Confined space - a tank, vessel, silo, storage bin, hopper, vault, pit, diked area, abandoned building, manhole, or any other enclosed space with limited means of exit or entry that is not designed for continuous occupancy.)

Did any team member enter a confined space area?

____ Yes ✓ No

If yes, please explain.

Accident Report Information

a. Did any team member report:	Yes	No
• Chemical Exposure	____	✓
• Illness, discomfort, or unusual symptoms	____	✓
• Environmental Problems (heat, cold, etc.)	____	✓

b. Explain:

c. Was an Employee Exposure/Injury Incident Report completed? ____ Yes ✓ No

TDD No.: 8710-11
Site Name: Ludlow.

Safety Plan Evaluation

a. Were there any deviations from the Safety Plan? ____ Yes ✓ No

If yes, please explain. _____

b. Was the Safety Plan adequate? ✓ Yes ____ No

c. What changes would you recommend?

None

NUS CORPORATION
999 WEST VALLEY ROAD
WAYNE, PENNSYLVANIA 19087
215-687-9510

October 26, 1987
C-585-10-7-57
68-01-7346

[redacted]
Alloy Surfaces Incorporated
100 Locke Road
Wilmington, Delaware 19802

Subject: Request for Site Access
TDD No. F3-8710-11
Ludlow Industrial Park Drum Site
Wilmington, Delaware

[redacted]

NUS Corporation is under Contract No. 68-01-7346 to provide technical and management services to the United States Environmental Protection Agency (EPA) in support of investigative activities at selected uncontrolled hazardous substance disposal sites. In this support capacity, we have received a work assignment to perform a site inspection as outlined below. The statutory basis for this inspection is contained in the attached Letter of Introduction, provided by EPA for the project team leader, [redacted]

In response to your discussion with [redacted] of this office, on October 26, 1987, please consider this a formal request for obtaining site access for Thursday, November 12, 1987 to the Ludlow Industrial Park Drum Site property in Wilmington, Delaware. The purpose of this request is to conduct a site inspection of the property in order to assess the need for further action by EPA.

If there are any questions, please do not hesitate to contact Mr. Kramer, Paul Dietrich, or Thomas Fromm.

Respectfully,

[redacted]
Regional Operations Manager,
FIT 3

GG/nmd

Attachment

8710-11-25

41550

ORIGINAL (Red)

GEO/HYDRO REQUEST TRACKING FORM

TASK:
- ___ PA
- _✓_ SI
- ___ Recon
- ___ Other _____

Project Name: Ludlow Industrial Park.
TDD No./Charge No.: F3-8710-11 / DE428IA
Section Supervisor (SS): Paul Dietrich
Project Leader (PL): Mark Kramer.
Geo/Hydro Preparer (G/HP): D Beaver
Field Geologist (FG): M. Kramer
Available Information: Attached from P.A. done by DE ~~NR~~ SES DNREC.
Date of Field Work: 11/9/87 Week of

PROCESS STEP	DATE/INITIAL	COMMENTS
Request to GHSC	11/9/87 SES/MK.	
Issued to G/HP		
Review Completed by G/HP Copies Distributed to PL and FG	DGB (10/23/87)	
Reviewed by GHSS		
Field Work by FG	MMK	
FG-G/HP-PL Collaboration	MMK	
G/HP Review Completed		
Final Review by GHSS	10-27-87 /TS	See below

*Requires site location map indicating quadrangle(s) and county
*Attach any available information (i.e., geology section of state PA or SI, well logs, etc.)

* More site specific info on coastal plain sed, if available thickness of formation, upper + over lying strata at site

Wilmington South Quad / New Castle County.

NUS CORPORATION
999 WEST VALLEY ROAD
WAYNE, PENNSYLVANIA 19087
215-687-9510

8710-11-02
411503
ORIGINAL (Red)

October 28, 1987
T-585-10-7-140
68-01-7346

[redacted]
U.S. Environmental Protection Agency
841 Chestnut Building
Ninth and Chestnut Streets
Philadelphia, PA 19107

Dear [redacted]

Attached please find Sampling Plan for Ludlow Industrial Park Drum Site, prepared under TDD No. F3-8710-11.

Please endorse below confirming that you have received the attached subject data and return the form to the above address.

Sincerely,

[redacted]
Regional Operations Manager,
FIT 3

GG/nmd

Attachments

Signature: [redacted]

Date: 11/2/87

41552 8710-11-01

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

SUBJECT: Request Assistance from FIT Office

DATE: 7/10/87

FROM: Joel Karmazyn, Site Investigation Officer
Site Investigation & Support Section (3HW23)

TO: Butch Byer, FIT Regional Project Officer
Site Investigation and Support Section (3HW23)

I. SITE NAME: Tudlow Industrial Park (De 121 / DSN)

II. LOCATION: 100 Locke Road
Wilmington, De 19802

III. WORK ASSIGNMENT:

___	Preliminary Assessment	___	Quality Assurance Review of Data
X	Site Inspection	X	Re-Sampling/~~Full Field Investigation~~
___	Hazard Ranking System	___	Peer Review Corrections/Finalize
___	Toxicology Assessment	___	Other (See VI below)
___	Enforcement Support	___	Site Reconnaissance

IV. PRIORITY:

___ High (*) X Medium ___ Low

V. Preferred Deadline:

Date: /

VI. EXPLANATION OF TASK (* To include justification for high priority):

Additional analytical request: pH, sulfate and nitrate for soil analysis.

SAS

Butch 8/26/87

VII. To be completed by FIT RPO only:

Task complete date by FIT: Nov 30-87

Hours allocated: 200

SODIUM HYDROXIDE
SODIUM HYDROXIDE
SODIUM HYDROXIDE

MATERIAL SAFETY DATA SHEET

FISHER SCIENTIFIC
CHEMICAL DIVISION
1 REAGENT LANE
FAIR LAWN NJ 07410
(201) 796-7100

EMERGENCY CONTACTS
GASTON L. PILLORI
(201) 796-7100

DATE: 04/26/86
PO NBR: N/A
ACCT: 697660-01
INDEX: N/A
CAT NO: S318100

THE INFORMATION BELOW IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, WE MAKE NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO SUCH INFORMATION, AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION FOR THEIR PARTICULAR PURPOSES.

SUBSTANCE IDENTIFICATION

CAS-NUMBER 1310-73-2

SUBSTANCE: **SODIUM HYDROXIDE**

TRADE NAMES/SYNONYMS: CAUSTIC SODA; SODA LYE; LYE; WHITE CAUSTIC; CAUSTIC ALKALI; CAUSTIC SODA, BEAD; CAUSTIC SODA, DRY; CAUSTIC SODA, FLAKE; CAUSTIC SODA, GRANULAR; CAUSTIC SODA, SOLID; SODIUM HYDRATE; SODIUM HYDROXIDE, BEAD; SODIUM HYDROXIDE, FLAKE; SODIUM HYDROXIDE, DRY; SODIUM HYDROXIDE, SOLID; S-613 ASCARITE; S-318; S-320; S-612

CHEMICAL FAMILY:
INORGANIC BASE

MOLECULAR FORMULA: NA-O-H MOL WT: 40.00

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=0 REACTIVITY=1 PERSISTENCE=0

COMPONENTS AND CONTAMINANTS

PERCENT: 97 COMPONENT: SODIUM HYDROXIDE

PERCENT: 0.50 COMPONENT: SODIUM CARBONATE

PERCENT: .008 COMPONENT: SODIUM CHLORIDE

PERCENT: <0.1 COMPONENT: SODIUM SULFATE

PERCENT: 0.1 COMPONENT: POTASSIUM, CALCIUM, AND MAGNESIUM

OTHER CONTAMINANTS: SILICON DIOXIDE (0.03%) AND OTHER METALS (0.01%).

EXPOSURE LIMITS:
2 MG/M3 OSHA TWA; 2 MG/M3 ACGIH CEILING; 2 MG/M3 NIOSH RECOMMENDED 15 MINUTE CEILING.

PHYSICAL DATA

DESCRIPTION: ODORLESS, WHITE OR OFF-WHITE HYGROSCOPIC SOLID.

BOILING POINT: 2534 F (1390 C) MELTING POINT: 605 F (318 C)

SPECIFIC GRAVITY: 2.1 VAPOR PRESSURE: 42 MMHG @ 1000 C

PH: 14 FOR A 5% AQ SOLN SOLUBILITY IN WATER: 42%

SOLVENT SOLUBILITY: ALCOHOL, GLYCEROL.

FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:
NEGLIGIBLE FIRE AND EXPLOSION HAZARD WHEN EXPOSED TO HEAT OR FLAME.

FLASH POINT: NON-FLAMMABLE

FIREFIGHTING MEDIA:
DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR FOAM
(1984 EMERGENGY RESPONSE GUIDEBOOK, DOT P 5800.3).

FOR LARGER FIRES, USE FLOODING QUANTITIES OF WATER.

FIREFIGHTING:
MOVE CONTAINERS FROM FIRE AREA IF POSSIBLE. COOL CONTAINERS EXPOSED TO FLAMES WITH WATER FROM SIDE UNTIL WELL AFTER FIRE IS OUT (1984 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.3).

TOXICITY

1%/24 HOURS EYE-MONKEY SEVERE IRRITATION; 50 MG/24 HOURS SKIN-RABBIT SEVERE IRRITATION; 1% EYE-RABBIT SEVERE IRRITATION; 50 UG/24 HOURS EYE-RABBIT SEVERE IRRITATION; 1 MG/24 HOURS EYE-RABBIT SEVERE IRRITATION;
CARCINOGEN STATUS: NONE.
SODIUM HYDROXIDE IS AN EYE AND MUCOUS MEMBRANE IRRITANT AND SEVERE SKIN IRRITANT.

HEALTH EFFECTS AND FIRST AID

INHALATION:
CORROSIVE. 200 MG/M3 IS IMMEDIATELY DANGEROUS TO LIFE AND HEALTH.
ACUTE EXPOSURE- THE EFFECTS OF THE DUST OR MIST WILL VARY FROM MILD IRRITATION OF THE NOSE @ 2 MG/M3 TO SEVERE PNEUMONITIS DEPENDING ON THE SEVERITY OF EXPOSURE. LOW CONCENTRATIONS MAY CAUSE SORE THROAT, COUGHING, AND LABORED BREATHING. INTENSE EXPOSURES MAY RESULT IN DELAYED PULMONARY EDEMA.

CHRONIC EXPOSURE- PROLONGED EXPOSURE MAY CAUSE BRONCHIAL IRRITATION, COUGHING, BRONCHIAL PNEUMONIA, AND GASTROINTESTINAL DISTURBANCES.

FIRST AID- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING

HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. KEEP AFFECTED PERSON WARM AND AT REST. GET MEDICAL ATTENTION AS SOON AS POSSIBLE.

SKIN CONTACT:
CORROSIVE.
ACUTE EXPOSURE- ON THE SKIN, SOLUTIONS OF 25 TO 50% MAY CAUSE THE SENSATION OF IRRITATION WITHIN ABOUT 3 MINUTES. WITH SOLUTIONS OF 4% THIS DOES NOT OCCUR UNTIL AFTER SEVERAL HOURS. IF NOT REMOVED FROM THE SKIN, SEVERE BURNS WITH DEEP ULCERATION MAY OCCUR. EXPOSURE TO THE DUST OR MIST MAY CAUSE MULTIPLE SMALL BURNS AND TEMPORARY LOSS OF HAIR.

CHRONIC EXPOSURE- REPEATED EXPOSURE MAY RESULT IN DERMATITIS.

FIRST AID- REMOVE CONTAMINATED CLOTHING WHILE RUNNING STREAMS OF WATER UNDER CLOTHING. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER (APPROXIMATELY 15-20 MINUTES) UNTIL NO EVIDENCE OF CHEMICAL REMAINS. FOR CHEMICAL BURNS, APPLY STERILE BANDAGE SECURELY, BUT NOT TOO TIGHTLY. GET MEDICAL ATTENTION.

EYE CONTACT:
CORROSIVE.
ACUTE EXPOSURE- CONTACT MAY CAUSE DISINTEGRATION AND SLOUGHING OF CONJUNCTIVAL AND CORNEAL EPITHELIUM, CORNEAL OPACIFICATION, MARKED EDEMA AND ULCERATION; AFTER 7 TO 13 DAYS EITHER GRADUAL RECOVERY BEGINS OR THERE IS PROGRESSION OF ULCERATION AND CORNEAL OPACIFICATION. COMPLICATIONS OF SEVERE EYE BURNS ARE SYMBLEPHARON WITH OVERGROWTH OF THE CORNEA BY A VASCULARIZED MEMBRANE, PROGRESSIVE OR RECURRENT CORNEAL ULCERATION AND PERMANENT CORNEAL OPACIFICATION.

CHRONIC EXPOSURE- REPEATED OR PROLONGED VAPOR CONTACT AT LOW LEVELS OF EXPOSURE MAY CAUSE CONJUNCTIVITIS.

FIRST AID- WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER, OCCASIONALLY LIFTING THE UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION.

INGESTION:
CORROSIVE.
ACUTE EXPOSURE- SEVERE ABDOMINAL PAIN, CORROSION OF THE LIPS, MOUTH, TONGUE, AND PHARYNX, AND VOMITING OF LARGE PIECES OF MUCOSA. ASPHYXIA CAN OCCUR FROM SWELLING OF THE THROAT. PERFORATION OF THE ESOPHAGUS AND STOMACH CAN OCCUR. CASES OF SQUAMOUS CELL CARCINOMA OF THE ESOPHAGUS HAVE OCCURRED WITH LATENT PERIODS OF 12 TO 42 YEARS AFTER INGESTION; A RESULT TISSUE DESTRUCTION AND POSSIBLY SCAR FORMATION RATHER THAN THE RESULT OF DIRECT CARCINOGENIC ACTION.

FIRST AID- IF VICTIM IS CONSCIOUS, GIVE HIM LARGE QUANTITIES OF WATER IMMEDIATELY TO DILUTE THE ALKALI. DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION IMMEDIATELY.

REACTIVITY

REACTIVITY:
THE SUBSTANCE IS A STRONG BASE. IT REACTS EXOTHERMICALLY WITH WATER RELEASING CORROSIVE FUMES OF SODIUM HYDROXIDE.

INCOMPATIBILITIES:

ACETALDEHYDE: RESULTS IN VIOLENT POLYMERIZATION OF ACETALDEHYDE.
ACETIC ACID: MIXING IN A CLOSED CONTAINER INCREASES TEMPERATURE AND PRESSURE
ACETIC ANHYDRIDE: MIXING IN A CLOSED CONTAINER INCREASES TEMPERATURE AND PRESSURE.
ACROLEIN: RESULTS IN AN EXTREMELY VIOLENT POLYMERIZATION OF ACROLEIN.
ACRYLONITRILE: VIOLENT POLYMERIZATION.
ALLYL ALCOHOL: AS A BENZENE EXTRACT OF ALLYL BENZENESULFONATE WAS PREPARED FROM ALLYL ALCOHOL AND BENZENE SULFONYL CHLORIDE IN THE PRESENCE OF AQUEOUS SODIUM HYDROXIDE, UNDER VACUM DISTILLATION TWO FRACTIONS CAME OFF, THEN THE TEMPERATURE ROSE TO 135 C, WHEN THE RESIDUE DARKENED AND EXPLODED.
ALLYL CHLORIDE: IN CONTACT WITH DRY CAUSTIC SODA BEADS, HYDROLYSIS MAY TAKE PLACE PRODUCING ALLYL ALCOHOL.
ALUMINUM: VIGOROUS REACTION WITH THE EVOLUTION OF FLAMMABLE HYDROGEN GAS.
CHLORINE TRIFLUORIDE: VIOLENT REACTION.
CHLOROFORM AND METHYL ALCOHOL: EXOTHERMIC REACTION.
CHLOROHYDRIN: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERATURE AND PRESSURE.
CHLORONITROTOLUENES: POSSIBLE EXPLOSION.
CHLOROSULFONIC ACID: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERATURE AND PRESSURE.
1,2-DICHLOROETHYLENE: MAY FORM SPONTANEOUSLY FLAMMABLE MONOCHLOROACETYLENE.
ETHYLENE CYANOHYDRIN: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERATURE AND PRESSURE.
GLYOXAL: MIXING IN A CLOSED CONTAINER INCREASES TEMPERATURE AND PRESSURE.
HALOGENATED HYDROCARBONS: VIOLENT REACTION.
HYDROCHLORIC ACID: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERATURE AND PRESSURE.
HYDROFLUORIC ACID: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERATURE AND PRESSURE.
HYDROQUINONE: RAPID DECOMPOSITION OF HYDROQUINONE WITH EVOLUTION OF HEAT.
MALEIC ANHYDRIDE: EXPLOSIVE DECOMPOSITION.
METALS: CORRODES METALS, REACTING TO FORM FLAMMABLE HYDROGEN GAS.
NITRIC ACID: MIXING IN A CLOSED CONTAINER INCREASES TEMPERATURE AND PRESSURE
NITROETHANE: FORMS AN EXPLOSIVE SALT.
NITROMETHANE: FORMS AN EXPLOSIVE SALT.
NITROPARAFFINS: THE NITROPARAFFINS, IN THE PRESENCE OF WATER, FORM DRY SALTS WITH ORGANIC BASES. THE DRY SALTS ARE EXPLOSIVE.
NITROPROPANE: FORMS AN EXPLOSIVE SALT.
OLEUM: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERATURE AND PRESSURE.
PENTOL (3-METHYL-2-PENTEN-4-YN-1-OL): POSSIBLE EXPLOSION.
PHOSPHORUS: PHOSPHORUS BOILED WITH ALKALINE HYDROXIDES YIELDS MIXED PHOSPHINES WHICH MAY IGNITE SPONTANEOUSLY IN AIR.
PHOSPHORUS PENTOXIDE: EXTREMELY VIOLENT REACTION WHEN INITIATED BY LOCAL HEATING.
B-PROPIOLACTONE: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERATURE AND PRESSURE.
SULFURIC ACID: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERAURE AND PRESSURE.
TETRACHLOROBENZENE AND METHYL ALCOHOL: POSSIBLE EXPLOSION.
TETRAHYDROFURAN: SERIOUS EXPLOSIONS CAN OCCUR.
TRICHLOROETHYLENE: FORMATION OF EXPLOSIVE MIXTURES OF DICHLOROACETYLENE.
WATER: CAUSTIC SODA BEADS IN CONTACT WITH WATER MAY GENERATE ENOUGH HEAT TO IGNITE ADJACENT COMBUSTIBLES.

DECOMPOSITION:
MAY RELEASE TOXIC FUMES OF SODIUM OXIDE, WHICH CAN REACT WITH WATER OR STEAM TO PRODUCE HEAT AND FLAMMABLE HYDROGEN VAPORS.

POLYMERIZATION:
NOT KNOWN TO OCCUR.

****
CONDITIONS TO AVOID

MAY BURN BUT DOES NOT IGNITE READILY. FLAMMABLE, POISONOUS GASES MAY ACCUMULATE IN TANKS AND HOPPER CARS. MAY IGNITE COMBUSTIBLES (WOOD, PAPER, OIL, ETC.).

****
SPILL AND LEAK PROCEDURES

SOIL SPILL:
DIG HOLDING AREA SUCH AS LAGOON, POND OR PIT FOR CONTAINMENT.

USE PROTECTIVE COVER SUCH AS A PLASTIC SHEET TO PREVENT MATERIAL FROM DISSOLVING IN FIRE EXTINGUISHING WATER OR RAIN.

WATER SPILL:
ADD SUITABLE AGENT TO NEUTRALIZE SPILLED MATERIAL TO PH-7.

OCCUPATIONAL SPILL:
DO NOT TOUCH SPILLED MATERIAL. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL. FOR SMALL DRY SPILLS, WITH CLEAN SHOVEL PLACE MATERIAL INTO CLEAN, DRY CONTAINER AND COVER. MOVE CONTAINERS FROM SPILL AREA. FOR LARGER SPILLS, DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. KEEP UNNECESSARY PEOPLE AWAY. ISOLATE HAZARD AREA AND DENY ENTRY.

PROTECTIVE EQUIPMENT

VENTILATION:
PROVIDE LOCAL EXHAUST VENTILATION SYSTEM TO MEET PERMISSIBLE EXPOSURE LIMITS.

RESPIRATOR:

100 MG/M3- HIGH-EFFICIENCY PARTICULATE RESPIRATOR WITH A FULL FACEPIECE.
SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE, HELMET, OR HOOD.
SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE.

200 MG/M3- POWERED AIR-PURIFYING RESPIRATOR WITH A HIGH-EFFICIENCY PARTICULATE FILTER AND A FULL FACEPIECE.
TYPE C SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE OR WITH A FULL FACEPIECE, HELMET, OR HOOD OPERATED IN CONTINUOUS-FLOW MODE.

ESCAPE- DUST MASK, EXCEPT SINGLE-USE AND QUARTER-MASK RESPIRATORS.
SELF-CONTAINED BREATHING APPARATUS.

FIREFIGHTING- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

CLOTHING:
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT TO PREVENT ANY POSSIBILITY OF SKIN CONTACT WITH THIS SUBSTANCE.

GLOVES:
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.

EYE PROTECTION:
EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES AND A FACESHIELD TO PREVENT CONTACT WITH THIS SUBSTANCE.

WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED TO THIS SUBSTANCE, THE EMPLOYER SHALL PROVIDE AN EYE-WASH FOUNTAIN WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

AUTHORIZED - ALLIED FISHER SCIENTIFIC
CREATION DATE: 01/21/85 REVISION DATE: 05/01/85

-ADDITIONAL INFORMATION-

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NITRIC ACID
NITRIC ACID
NITRIC ACID

MATERIAL SAFETY DATA SHEET

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CHEMICAL DIVISION
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FAIR LAWN NJ 07410
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EMERGENCY CONTACTS
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CAT NO: A200S500

SUBSTANCE IDENTIFICATION

CAS-NUMBER 7697-37-2

SUBSTANCE: **NITRIC ACID**

TRADE NAMES/SYNONYMS: AQUA FORTIS; HYDROGEN NITRATE; AZOTIC ACID; NITRYL HYDROXIDE; A-200; A-200C; A-200S; A-198; A-202; A-206-C

CHEMICAL FAMILY:
INORGANIC ACID

MOLECULAR FORMULA: H-N-O3 MOL WT 63.02

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=0 REACTIVITY=0 PERSISTENCE=0

COMPONENTS AND CONTAMINANTS

PERCENT: 70 COMPONENT: HYDROGEN NITRATE

PERCENT: 30 COMPONENT: WATER

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:
2 PPM (5 MG/M3) OSHA TWA; 2 PPM NIOSH RECOMMENDED TWA;
2 PPM ACGIH TWA; 4 PPM ACGIH STEL

PHYSICAL DATA

DESCRIPTION: COLORLESS FUMING LIQUID WITH AN ACRID ODOR; SUFFOCATING FUMES. THE ODOR IS NOT CONSIDERED AN ADEQUATE WARNING PROPERTY.

BOILING POINT: 181 F (83 C) MELTING POINT: -44 F (-42 C)

SPECIFIC GRAVITY: 1.5 VAPOR PRESSURE: 62 MMHG @ 25 C

EVAPORATION RATE: NOT AVAILABLE SOLUBILITY I ATER: MISCIBLE

SOLVENT SOLUBILITY: ETHER ODOR THRESHOLD: <5.0 PPM VAPOR DENSITY: 2.2

FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:
INCREASES THE FLAMMABILITY OF COMBUSTIBLES, ORGANIC MATERIAL, AND READILY OXIDIZABLE MATERIALS, CAUSING IGNITION OF SOME. SEVERE EXPLOSION HAZARD BY REACTION WITH MANY INCOMPATIBLES, INCLUDING METALLIC POWDERS, CARBIDES, HYDROGEN SULFIDE, AND TURPENTINE. IN OR NEAR FIRE, MATERIAL EMITS TOXIC AND REACTIVE NITROGEN OXIDES AS GASES.

FLASH POINT: NONCOMBUSTIBLE

FIREFIGHTING MEDIA:
WATER SPRAY

FIREFIGHTING:
MOVE CONTAINER FROM FIRE AREA IF POSSIBLE. COOL CONTAINERS EXPOSED TO FLAMES WITH WATER FROM SIDE UNTIL WELL AFTER FIRE IS OUT. FOR MASSIVE FIRE IN STORAGE AREA, USE UNMANNED HOSE HOLDER OR MONITOR NOZZLES; ELSE WITHDRAW FROM AREA AND LET FIRE BURN (1984 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.3).

EXTINGUISH USING AGENTS INDICATED. IF LARGE AMOUNTS OF COMBUSTIBLE MATERIALS ARE INVOLVED, USE WATER SPRAY OR FOG IN FLOODING AMOUNTS. USE WATER SPRAY TO ABSORB CORROSIVE VAPORS. COOL CONTAINERS WITH FLOODING AMOUNTS OF WATER FROM AS FAR A DISTANCE AS POSSIBLE. AVOID BREATHING CORROSIVE VAPORS; KEEP UPWIND

TOXICITY

430 MG/KG ORAL-HUMAN LDLO; 110 MG/KG UNKNOWN-MAN LDLO;
CARCINOGEN STATUS: NONE.
NITRIC ACID IS A SEVERE EYE, MUCOUS MEMBRANE, AND SKIN IRRITANT.

HEALTH EFFECTS AND FIRST AID

INHALATION:
CORROSIVE. 100 PPM IS IMMEDIATELY DANGEROUS TO LIFE AND HEALTH.
ACUTE EXPOSURE- MAY CAUSE COUGHING, HEADACHE, DIZZINESS, AND WEAKNESS. DELAYED SYMPTOMS MAY INCLUDE DRYNESS OF THE THROAT AND NOSE, CHEST PAIN OR TIGHTNESS, DYSPNEA, FROTHY SPUTUM, HYPOTENSTION AND CYANOSIS FOLLOWED BY PNEUMONITIS AND PULMONARY EDEMA, WHICH MAY BE FATAL. IF PATIENT RECOVERS, SCAR TISSUE MAY CAUSE STRICTURE OF THE PYLORUS OR ESOPHAGUS.

CHRONIC EXPOSURE- REPEATED OR PROLONGED EXPOSURE CAUSES DENTAL EROSION FOLLOWED BY JAW NECROSIS, CHRONIC COUGH AND BRONCHITIS OR CHEMICAL PNEUMONITIS AND GASTROINTESTINAL DISTURBANCES.

FIRST AID- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. MAINTAIN AIRWAY AND ADMINISTER OXYGEN IF AVAILABLE. KEEP AFFECTED PERSON WARM AND AT REST.

SKIN CONTACT:
CORROSIVE.
ACUTE EXPOSURE- DIRECT CONTACT WITH LIQUID OR CONCENTRATED VAPOR CAUSES IMMEDIATE SEVERE AND PENETRATING BURNS, STAINING THE SKIN YELLOW OR YELLOWISH-BROWN.

CHRONIC EXPOSURE- PROLONGED OR REPEATED EXPOSURE MAY CAUSE DERMATITIS.

FIRST AID- REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). IN CASE OF CHEMICAL BURNS, COVER AREA WITH STERILE, DRY DRESSING. BANDAGE SECURELY, BUT NOT TOO TIGHTLY. GET MEDICAL ATTENTION.

EYE CONTACT:
CORROSIVE.
ACUTE EXPOSURE- DIRECT CONTACT WITH THE LIQUID MAY CAUSE PAIN, PHOTOPHOBIA, TEARING, EDEMA, CORNEAL ULCERATION, SEVERE BURNS, AND NECROSIS OF THE DEEPER TISSUES WITH PERMANENT DAMAGE AND BLINDNESS IS POSSIBLE.

CHRONIC EXPOSURE- REPEATED OR PROLONGED EXPOSURE MAY CAUSE CONJUNCTIVITIS.

FIRST AID- WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). IN PRESENCE OF BURNS, APPLY STERILE BANDAGES LOOSELY WITHOUT MEDICATION. GET MEDICAL ATTENTION.

INGESTION:
CORROSIVE.
ACUTE EXPOSURE- IMMEDIATE PAIN IN THE MOUTH, THROAT, AND STOMACH MAY BE FOLLOWED BY VOMITING, AND DIARRHEA OF DARK PRECIPATED BLOOD. HYPOTENSION, OLIGURIA, ANURIA, SEVERE, POSSIBLY FATAL, CIRCULATORY COLLAPSE, AND ASPHYXIA FROM EDEMA OF THE GLOTTIS ARE POSSIBLE. BURNS OF THE GASTROINTESTINAL TRACT MAY BE SEVERE ENOUGH TO CAUSE PERFORATION OF THE ESOPHAGUS AND STOMACH WHICH MAY BE FOLLOWED BY MEDIASTINITUS OR PERITONITIS, INDICATED BY FEVER.

FIRST AID- IF VICTIM IS CONSCIOUS, GIVE HIM LARGE QUANTITIES OF WATER IMMEDIATELY TO DILUTE THE ACID. DO NOT INDUCE VOMITING. GIVE PATIENT 1 OUNCE (30 ML) OF MILK OF MAGNESIA. GET MEDICAL ATTENTION IMMEDIATELY.

REACTIVITY

REACTIVITY:
STABLE UNDER NORMAL TEMPERATURES AND PRESSURES. HOWEVER NITRIC VAPOR AND/OR NITRIC OXIDES ARE QUIETLY EVOLVED. ALSO SUNLIGHT CATLAYSES THE FORMATION OF THE OXIDES AND THIS GIVES A YELLOW COLOR TO THE CONCENTRATED ACID.

INCOMPATIBILITIES:
EASILY OXIDIZED SUBSTANCES, EXAMPLES FOLLOW:

EXPLOSION: ACETONITRILE, CESIUM CARBIDE, CUPRIC NITRIDE, CYANIDES, 1,2-DIAMINOETHANE BISTRIMETHYL GOLD, DINITROTOLUENE, EPICHLOROHYDRIN, 5-ETHYL-2-METHYL PYRIDINE, CYCLOPENTADIENE, BENZENE, TOLUENE, METALS, METAL CARBIDES, 4-METHYLCYCLOHEXANONE, NITROBENZENE AND WATER, NITROMETHANE, POLYDIBROMOSILANES, PHOSPHORUS TRICHLORIDE, POTASSIUM HYPOPHOSPHITE (ON EVAPORATION), RUBIDIUM CARBIDE, SELENIUM IODOPHOSPHIDE, SULFUR DIOXIDES, THIOCYANATES,

THIOCYANIC ACID METAL SALTS, THIOPHENES, TETRA[illegible]ANE, TRICADMIUM DIPHOSPHIDE, TRITHIOACETONE.
PROBABLE EXPLOSION: ACETONE AND ACETIC ACID, SULFURIC ACID AND GLYCERIDES, TRIAZINE AND TRIFLUOROACETIC ANHYDRIDE @ 36 C.
POSSIBLE EXPLOSION: ACETIC ACID, I-AMINOTHIAZOLE AND SULFURIC ACID, CYANATES, 1,3-CYCLOPENTADIENE, FLURORINE, LACTIC ACID AND HYDROGEN FLUORIDE, MESITYLENE, ORGANIC SUBSTANCES AND SULFURIC ACID, ORGANIC SUBSTANCES AND PERCHLORATES, PHTHALIC ACID OR PHTHALIC ANHYDRIDE AND SULFURIC ACID, REDUCING AGENTS, SULFURIC ACID, TITANIUM ALLOY.
EXPLOSION BY FRICTION OR IMPACT: ACETIC ANHYDRIDE.
EXPLOSIVE OXIDATION: NON-METAL OXIDES- ARSINE, PHOSPHINE, OR TETRABORANE, DIPHENYLDISTIBENE.
POSSIBLE EXPLOSION BY IMPACT : TITANIUM-MAGNESIUM ALLOY.
VIOLENT REACTION: ACRYLONITRILE, ALCOHOLS, ARSINE, CARBON (PULVERIZED), CHLORINE TRIFLUORIDE, CUPROUS NITRIDE, CYCLIC KETONES, CYCLOHEXANOL, ETHANOL, GERMANIUM, HYDRAZINE, SULFUR HALIDES, SULFURIC ACID AND TEREPHTHALIC ACID, THIOALDEHYDES OR THIOKETONES, URANIUM, URANIUN ALLOYS.
VIOLENT OXIDATION: ACETONE AND SULFURIC ACID, SULFAMIC ACID.
VIOLENT DECOMPOSITION: BUTANETHIOL, PHOSPHINE.
VIOLENT DECOMPOSITION RESULTING IN IGNITION: CROTONALDEHYDE, TETRAPHOSPHORUS TRIIODIDE.
POSSIBLE VIOLENT REACTION: ANTIMONY.
POSSIBLE VIOLENT EXOTHERMIC REACTION: ANION EXCHANGE RESIN.
INTENSE EXOTHERMIC REACTION: ACROLEIN, ALLYL ALCOHOL, ALLYL CHLORIDE, 2-AMINOETHANOL, AMMONIUM HYDROXIDE, BISMUTH, N-BUTYRALDEHYDE, CHLOROSULFONIC ACID, CRESOL, CUMENE, DIISOPROPYL ETHER, ETHYLENEDIAMINE, POLYALKENES, GLYOXAL, ISOPRENE, MESITYL OXIDE, 2-METHYL-5-ETHYLPYRIDINE, OLEUM, PROPYLENE OXIDE, PROPIOLACTONE (BETA-), PYRIDENE, SODIUM HYDROXIDE, VINYL ACETATE, VINYLDENE CHLORIDE,.
INTENSE REACTION: DIETHYLETHER, HYDRAZOIC ACID, P-XYLENE IN THE PRESENCE OF SULFURIC ACID, SELENIUM, SODIUM AZIDE, TOLUENE, TRIMETHYLTRIOXANE.
IGNITION WITH POSSIBLE EXPLOSION: HYDROGEN TELLURIDE.
IGNITION: ANILINE, BORON PHOSPHIDE, BROMINE PENTAFLUORIDE, N-BUTYLMERCAPTAN, CALCIUM HYPOPHOSPHITE, DIBORANE, DIPHENYL TIN, M-ETHYL ANILINE, ETHYL PHOSPHINE, FURFURYL ALCOHOL, HALOGEN PHOSPHIDES, HYDROGEN IODIDES, LITHIUM, METALS, PHOSPHONIUM IODIDE, PHOPHORUS, SELENIUM HYDRIDE, SODIUM, TERPENES, TOLUIDINE, TRIETHYLGALLIUM MONOETHYL ETHER COMPLEX, UNS-DIMETHYLHYDRAZINE.
POSSIBLE IGNITION: AMMONIA, ANION EXCHANGE RESIN AND CHROMITES OR DICHROMATE, AROMATIC AMINES, DIVINYL ETHER, DIENE OR ACETYLENE DERIVATIVES, LITHIUM, REDUCING AGENTS.
INCANDESCENT REACTION: BORON, FERROUS OXIDE (POWDER), HYDROGEN SULFIDE, LITHIUM SILICIDE, SELENIUM HYDRIDE, MAGNESIUM PHOSPHIDE, MANGANESE, ZINC.
FORMATION OF HIGHLY EXPLOSIVE PRODUCTS: NITROAROMATIC HYDROCARBONS.
FORMATION OF EXPLOSIVE PRODUCTS: ACETYLENE, 4-CHLORO-2-NITROANILINE, CYCLOHEXANE, CYCLOHEXYLAMINE, 2,6-DI-T-BUTYL PHENOL, DICHLOROMETHANE, ETHANOL AND SILVER, 5-ETHYL-2-PICOLINE, HYDROGEN PEROXIDE AND KETONES, HYDROGEN PEROXIDE AND MERCURIC OXIDE, HYDROGEN PEROXIDE AND THIOUREA, INDANE AND SULFURIC ACID, METAL SALICYLATES, PHENYLORTHOPHOSPHORIC ACID DISODIUM SALT, TITANIUM.
FORMATION OF POSSIBLY EXPLOSIVE PRODUCTS: BENZOTHIOPHENE DERIVATIVES.
FORMATION OF EASILY COMBUSTIBLE ESTER: CELLULOSE.
DETONATABLE MIXTURE (DEPENDING ON AMOUNT OF WATER PRESENT): NITROBENZENE.

DECOMPOSITION:
DECOMPOSES ON EXPOSURE TO AIR OR ORGANIC MATTER, OR WITH HEAT, TO RELEASE HIGHLY TOXIC FUMES OR OXIDES OF NITROGEN, INCLUDING NITRIC OXIDE AND NITROGEN DIOXIDE, AND HYDROGEN NITRATE. REACTS WITH THE FOLLOWING TO RELEASE TOXIC GASES: SULFIDES, CARBONATES, CYANIDES. VIOLENT REACTION WITH ALL CARBIDES, GAS MIXTURE EVOLVED (N2O4) REACTS STRONGLY WITH HYDROCARBONS, FLUORINE, OR

FORMALDEHYDE.

POLYMERIZATION:
WILL NOT OCCUR.

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CONDITIONS TO AVOID

MAY IGNITE COMBUSTIBLE MATERIALS (WOOD, PAPER, OIL, ETC.). REACTS VIOLENTLY WITH WATER AND FUELS. FLAMMABLE, POISONOUS GASES MAY ACCUMULATE IN TANKS AND HOPPER CARS. RUNOFF TO SEWER MAY CREATE FIRE OR EXPLOSION HAZARD. AVOID CONTACT WITH OR STORAGE WITH INCOMPATIBLE MATERIALS, INCLUDING THOSE MATERIALS AND CLASSES OF MATERIALS LISTED IN THE REACTIVITY SECTION. HEATING MAY INCREASE THE EVOLUTION OF NITRIC ACID VAPOR AND/OR NITROGEN OXIDES (GASES) BEYOND AN ACCEPTABLE LEVEL.

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SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:
KEEP COMBUSTIBLES (WOOD, PAPER, OIL AND OTHER EASILY OXIDIZABLE MATERIALS) AWAY FROM SPILLED MATERIAL. WEAR PERSONAL PROTECTIVE EQUIPMENT. DO NOT TOUCH SPILLED MATERIAL. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. DILUTE SPILLS OR LEAKS WITH PLENTY OF WATER. NEUTRALIZE RESIDUE WITH (A) ALKALI, SUCH AS SOLDA ASH, LIME, LIMESTONE; OR (B) OTHER SUITABLE NEUTRALIZATION MATERIALS. ADEQUATE VENTILATION IS REQUIRED TO ELIMINATE ANY NITROGEN OXIDES RELEASED AND, IF SODA ASH OR LIMESTONE IS USED, CO2. ABSORB WITH EXCESS SODA ASH, SCOOP UP AND PLACE IN A SUITABLE E.G. GLASS OR PLASTIC CONTAINER AND CLOSE. LABEL 'OXIDIZER'. KEEP OUT OF SEWERS AND WATER SOURCES. KEEP UNNECESSARY PEOPLE AWAY. ISOLATE HAZARD AREA AND DENY ENTRY. VENTILATE CLOSED SPACES BEFORE ENTERING.

PROTECTIVE EQUIPMENT

VENTILATION:
PROVIDE LOCAL EXHAUST VENTILATION, PROCESS ENCLOSURE OR GENERAL DILUTION VENTILATION TO MEET PERMISSABLE EXPOSURE LIMITS REQUIREMENTS. EQUIPMENT MUST BE CORROSION-RESISTANT.

RESPIRATOR:
EXPOSURE LIMIT TO 100 MG/M3-
SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.
TYPE 'C' SUPPLIED-AIR RESPIRATOR OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE OR CONTINUOUS FLOW MODE.

—> 100 MG/M3, INCLUDING THE IDLH LEVEL, 250 MG/M3-
SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE, OR USE EQUIVALENT RESPIRATOR.

FIREFIGHTING- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

CLOTHING:
EMPLOYEE MUST WEAR IMPERVIOUS CLOTHING AS NECESSARY TO AVOID ANY POSSIBILITY

MATHESON GAS PRODUCTS
MATERIAL SAFETY DATA SHEET

ORIGINAL (Red)

002

PRODUCT IDENTIFICATION

MSDS002: AIR

SYNONYM(S): None

CHEMICAL FORMULA: None

C.A.S. NUMBER: None

D.O.T. SHIPPING NAME: Air, compressed

D.O.T. I.D. NUMBER: UN1002

D.O.T. HAZARD CLASS: Nonflammable Gas

D.O.T. LABEL(S): Nonflammable Gas

PHYSICAL DATA

MOLECULAR WEIGHT: 28.96

BOILING POINT: -194.35°C; -317.8°F

SPECIFIC VOLUME @ 1 ATM, 21.1°C: 0.830 m^3/kg; 13.3 ft^3/lb

DESCRIPTION: Air is a colorless, odorless, nonflammable gas mixture composed of approximately 79% nitrogen by volume and 21% oxygen by volume. It is compressed and shipped in high pressure cylinders. Unless specifically labeled it is not to be used for breathing purposes.

FIRE AND EXPLOSION HAZARD DATA

FLAMMABLE LIMITS IN AIR: Nonflammable

FIRE FIGHTING PROCEDURES: Air is nonflammable and as such does not create a fire hazard. However, cylinders that are exposed to fire may rupture with violent force. They may be kept cool using a water spray applied from the maximum possible distance.

UNUSUAL FIRE AND EXPLOSION HAZARDS: High pressure air can greatly accelerate combustion.

HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LIMITS:

OSHA TWA: Not applicable

ACGIH TWA: Not applicable

ACUTE EFFECTS OF OVEREXPOSURE: Not Applicable

CHRONIC EFFECTS OF OVEREXPOSURE: Not Applicable

FIRST AID INFORMATION

Not applicable

REACTIVITY DATA

Air is a stable mixture.

Keep high pressure air away from oil, grease and readily ignitable materials. Under pressure it greatly accelerates combustion.

SPILL OR LEAK PROCEDURE

No special procedures are required. Compressed air is not hazardous except in the presence of oil, grease and other readily ignitable materials.

ORIGINAL (Red)

PRECAUTIONARY INFORMATION

STORAGE RECOMMENDATIONS: Cylinders should be stored and used in dry areas away from source of heat.

PERSONAL PROTECTIVE EQUIPMENT:

EYE PROTECTION - Safety glasses should be worn.

SKIN PROTECTION - No special equipment is required. Gloves are recommended for cylinder handling.

BEFORE USING THE GAS:

1. Secure the cylinder to prevent it from falling or being knocked over.
2. Leak check the lines and equipment.

* * * *

IN CASE OF EMERGENCY CALL THE NEAREST MATHESON LOCATION

Cucamonga, CA (714) 987-4611, Newark, CA (415) 793-2559, Morrow, GA (404) 961-7891, Joliet, IL (815) 727-4848, Gloucester, MA (617) 283-7700, East Rutherford, NJ (201) 933-2400, Twinsburg, OH (216) 425-4406, La Porte, TX (713) 471-2544

ORIGINAL (Red)

ALCONOX POWDER DETERGENT 04-322-4

Material Safety Data Sheet

Required under USDL Safety and Health Regulations for Shipyard Employment (29 CFR 1915)

U.S. Department of Labor
Occupational Safety and Health Administration

OMB No. 1218-0074
Expiration Date 05/31/86

PREPARED 1/2/85

Section I

Manufacturer's Name: ALCONOX, INC.

Emergency Telephone Number: (212) 473-1300

Address (Number, Street, City, State, and ZIP Code): 215 PARK AVENUE SOUTH

NEW YORK, N.Y. 10003

Chemical Name and Synonyms: N.A.

Trade Name and Synonyms: ALCONOX

Chemical Family: ANIONIC DETERGENT

Formula: N.A.

Section II - Hazardous Ingredients

Paints, Preservatives, and Solvents	%	TLV (Units)	Alloys and Metallic Coatings	%	TLV (Units)
Pigments: NONE			Base Metal: NONE		
Catalyst: NONE			Alloys: NONE		
Vehicle: NONE			Metallic Coatings: NONE		
Solvents: NONE			Filler Metal Plus Coating or Core Flux: NONE		
Additives: NONE			Others: NONE		
Others: NONE					

Hazardous Mixtures of Other Liquids, Solids or Gases

	%	TLV (Units)
NONE		

RECEIVED AUG 1985

Section III - Physical Data

Boiling Point (°F)	N.A.	Specific Gravity (H_2O=1)	N.A.
Vapor Pressure (mm Hg.)	N.A.	Percent Volatile by Volume (%)	N.A.
Vapor Density (AIR=1)	N.A.	Evaporation Rate (_____=1)	N.A.

Solubility in Water: APPRECIABLE

Appearance and Odor: WHITE POWDER INTERSPERSED WITH CREAM COLORED FLAKES - ODORLESS

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	Lel	Uel
NONE	N.A.	N.A.	N.A.

Extinguishing Media: WATER, CO_2, DRY CHEMICAL, FOAM, SAND/EARTH

Special Fire Fighting Procedures: FOR FIRES INVOLVING THIS MATERIAL, DO NOT ENTER WITHOUT PROTECTIVE EQUIPMENT AND SELF CONTAINED BREATHING APPARATUS

Unusual Fire and Explosion Hazards: NONE

ORIGINAL (Red)

Section V - Health Hazard Data

Hi COXOX Powder
04-322-4
04-322-5B, 5C & 5D

Threshold Limit Value

NO DATA AVAILABLE - TREAT AS NUISANCE DUST

Effects of Overexposure

PROLONGED EXPOSURE TO DUST MAY IRRITATE MUCOUS MEMBRANES

Emergency First Aid Procedures

EYES - FLUSH WITH PLENTY OF WATER FOR 15 MINUTES. SKIN-FLUSH WITH PLENTY OF WATER. INGESTION - DRINK LARGE QUANTITIES OF WATER TO DILUTE MATERIAL. GET MEDICAL ATTENTION FOR DISCOMFORT.

Section VI - Reactivity Data

Stability	Unstable		Conditions to Avoid: NONE
	Stable: X		

Incompatability (Materials to Avoid): AVOID STRONG ACIDS

Hazardous Decomposition Products: MAY RELEASE CO_2 GAS ON BURNING

Hazardous Polymerization	May Occur		Conditions to Avoid: NONE
	Will Not Occur: X		

Section VII - Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled

MATERIAL FOAMS PROFUSELY. SHOVEL AND RECOVER AS MUCH AS POSSIBLE. RINSE REMAINDER TO SEWER. MATERIAL IS COMPLETELY BIODEGRADABLE.

Waste Disposal Method

SMALL QUANTITIES MAY BE DISPOSED OF IN SEWER. LARGE QUANTITIES SHOULD BE DISPOSED OF ACCORDING TO LOCAL REQUIREMENTS FOR NON-HAZARDOUS DETERGENT

Section VIII - Special Protection Information

Respiratory Protection Specify Type: DUST MASK

Ventilation	Local Exhaust: NORMAL	Special: N.A.	
	Mechanical (General): N.A.	Other: N.A.	

Protective Gloves: USEFUL - NOT REQUIRED	Eye Protection: USEFUL - NOT REQUIRED

Other Protective Equipment: NOT REQUIRED

Section IX - Special Precautions

Precautions to be Taken in Handling and Storing

SHOULD BE STORED IN A DRY AREA TO PREVENT CAKING

Other Precautions

NO SPECIAL REQUIREMENTS OTHER THAN THE GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES EMPLOYED WITH ANY INDUSTRIAL CHEMICAL.

NUS CORPORATION
999 WEST VALLEY ROAD
WAYNE, PENNSYLVANIA 19087
215-687-9510

415517 ORIGINAL (Red)

October 28, 1987
C-585-10-7-62
68-01-7346

Mr. Kenneth R. Kryszczun
U.S. Environmental Protection Agency
841 Chestnut Building
Ninth and Chestnut Streets
Philadelphia, PA 19107

Subject: Sampling Plan
TDD No. F3-8710-11
EPA No. DE-121
Ludlow Industrial Park Drum Site
Wilmington, Delaware

Dear Mr. Kryszczun:

The site inspection for the subject site has been scheduled for Thursday, November 12, 1987. Permission for site access was granted by Melissa Toms, of Alloy Surfaces, Incorporated, which is a subsidiary of RSC Realty, the site owner.

Summary

The site is a former 10-acre drum storage area located at 100 Locke Road in Edgmore, Wilmington, New Castle County, Delaware. Approximately 135 fifty-five-gallon drums, 2 pressurized cylinders, and 3 underground tanks were discovered by Alloy Surfaces, Incorporated in 1983. This waste is thought to have been left by the former site owner, Ludwig Honold Manufacturing Company, which operated an electroplating operation from 1975 to 1981.

RSC Realty Corporation hired Eldredge Environmental to characterize and dispose materials located on their portion of the site. The drums contained toxic soda, waste solvents, and waste nitric acid. The underground tanks contained no. 6 fuel, with some polychlorinated biphenyl (PCB) Aroclor 1242 (3 mg/kg). Cleanup of ConRail's portion of the site was completed by O.H. Materials on August 20, 1986. Delaware Department of Natural Resources and Environmental Control (DE DNREC) investigators conducted a preliminary assessment of the site on June 1, 1987.

ORIGINAL (Red)

Geology Information

The Ludlow Industrial Park Drum Site is located in the Coastal Plain Physiographic Province. Sediments of the area are generally early to late Cretaceous in age and are unconformably overlain in most places by sediments of the Columbia Formation, which is of Pleistocene age. The Columbia Formation ranges from 0 to 10 feet thick and is composed primarily of poorly sorted fluvial sands with some interbedded gravels, silts, and clays. The Potomac Formation consists of multi-colored lignitic silts and clays containing interbedded white, gray, and brown quartz sands and some gravel.

Soils at the site consist of the Aldino-Keyport-Mattapex-Urban Land Complex and the Othello-Fallsington-Urban Land Complex. These are characterized by moderately well-drained medium-textured soils and poorly drained medium-textured soils, respectively.

Sampling to Date

Samples were taken from drums and tanks, which were removed from site in order to characterize waste types. Results indicated that toxic soda, waste solvents, waste nitric acid, and no. 6 fuel, with some Aroclor 1242, were present within the drums and tanks.

According to available information, no additional on-site samples were taken at the site.

Proposed Sampling Plan

The proposed sampling locations include the following:

- Up to 10 surface soil samples will be collected in the area of drum storage, any drainage pathways, or any stressed vegetation or stained soil that can be identified during the site reconnaissance to occur immediately prior to the site inspection.

- Up to 10 auger samples will be obtained in areas of former drum storage, drainage pathways, or stained soil and stressed vegetation that can be identified by FIT 3.

A map indicating the exact area of storage for particular waste drums has been requested of David Diefenthaler, of DE DNREC. Upon receipt of this map, NUS FIT 3 can better identify possible sample locations.

ORIGINAL (Red)

The total number of samples to be obtained is 22, including a blank and duplicate. Sample analysis will be performed for organics and inorganic tasks 1 and 2, and 3 for cyanide. Also, a request for special analytical services (SAS) will be made to have the samples analyzed for nitrates and sulfates, as per EPA request. All samples will be obtained in accordance with standard protocols as indicated on the site-specific work plan.

Mark Kramer has been appointed team leader and will be responsible for the sampling plan.

Please endorse below and return with your approval or amendments to this plan. If you have any questions, please feel free to contact either Paul Dietrich or Thomas Fromm.

Respectfully,

[redacted]
Regional Operations Manager, FIT 3

[redacted]
Assistant Manager

[redacted]
Quality Assurance

GG/rmk

Attachment

Approved by: _____

Date: _____

Amendments: _____

_____

_____

_____

8 710-11-07

42247

ORIGINAL
(Red)

NUS CORPORATION

999 WEST VALLEY ROAD
WAYNE, PENNSYLVANIA 19087
215-687-9510

December 2, 1987
T-585-12-7-6
68-01-7346

Mr. [redacted]
U.S Environmental Protection Agency
841 Chestnut Building
Ninth and Chestnut Streets
Philadelphia, PA 19107

Dear [redacted]

Attached please find two uncontrolled final copies of the site visit summary report for Ludlow Industrial Park Drum Site prepared under TDD No. F3-8710-11.

Please endorse below confirming that you have received the attached subject data and return the form to the above address.

Sincerely,

[redacted]

[redacted]
Regional Operations Manager,
FIT 3

GG/ls

Attachments

Signature: _____

Date: 1/4/88

8110-N-08

422248

ORIGINAL
(Red)

NUS CORPORATION

999 WEST VALLEY ROAD
WAYNE, PENNSYLVANIA 19087
215-687-9510

December 1, 1987
T-585-12-7-1
68-01-7346

Mr. [redacted]
U.S Environmental Protection Agency
841 Chestnut Building
Ninth and Chestnut Streets
Philadelphia, PA 19107

Dear [redacted]

Attached please find a copy of the state preliminary assessment for Ludlow Industrial Park Drum Site (DE-121), TDD No. F3-8710-11. Please forward to Paul Racette. Thank you.

Please endorse below confirming that you have received the attached subject data and return the form to the above address.

Sincerely,

[redacted]
Regional Operations Manager,
FIT 3

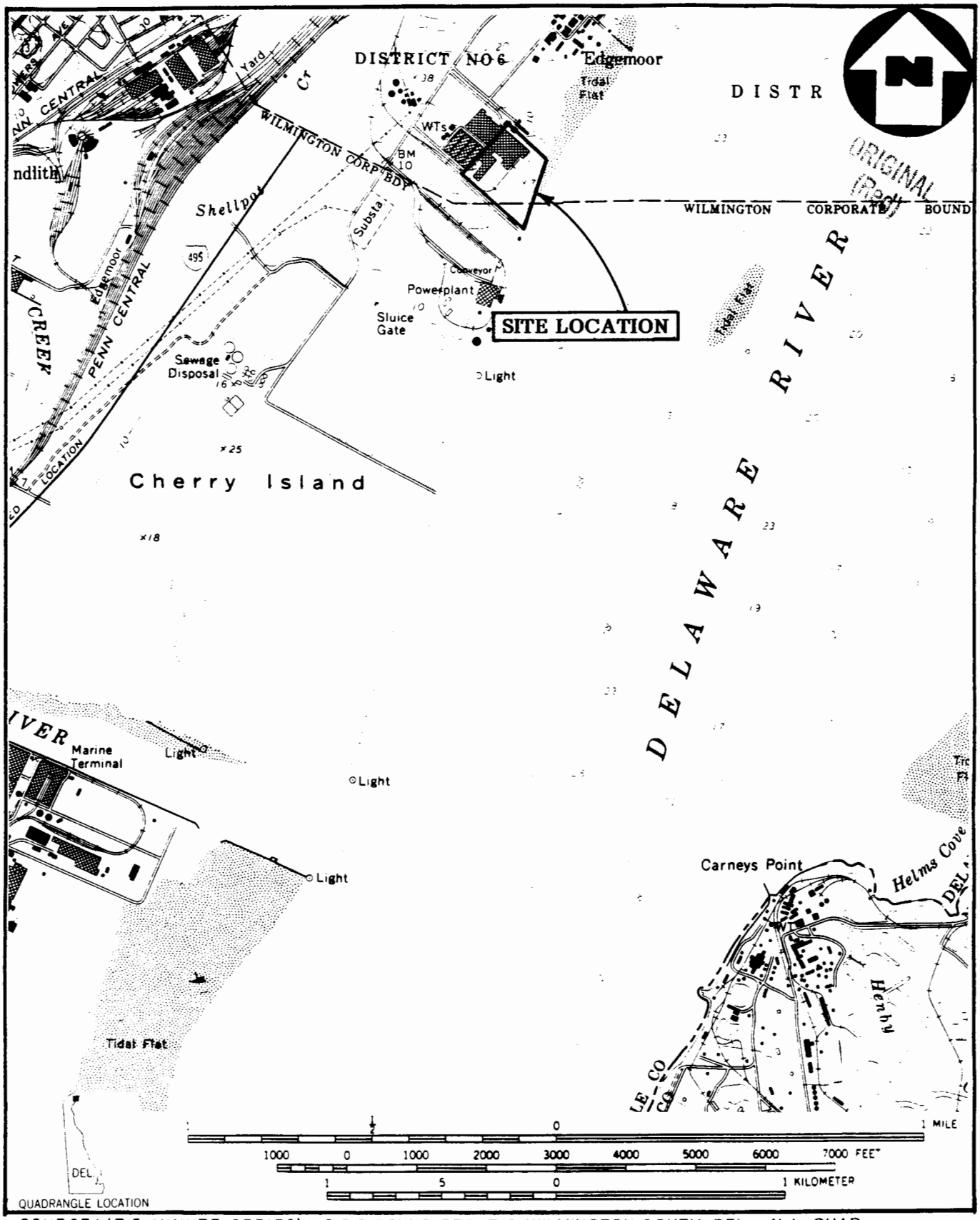
GG/dg

Attachments

Signature: [redacted]

Date: 12/3/87

ATTACHMENT 1



SOURCE: (7.5 MINUTE SERIES) U.S.G.S PENNS GROVE & WILMINGTON SOUTH, DEL. - N.J., QUAD.

FIGURE 1

SITE LOCATION MAP
LUDLOW INDUSTRIAL PARK DRUM SITE

SCALE 1: 24000

NUS CORPORATION

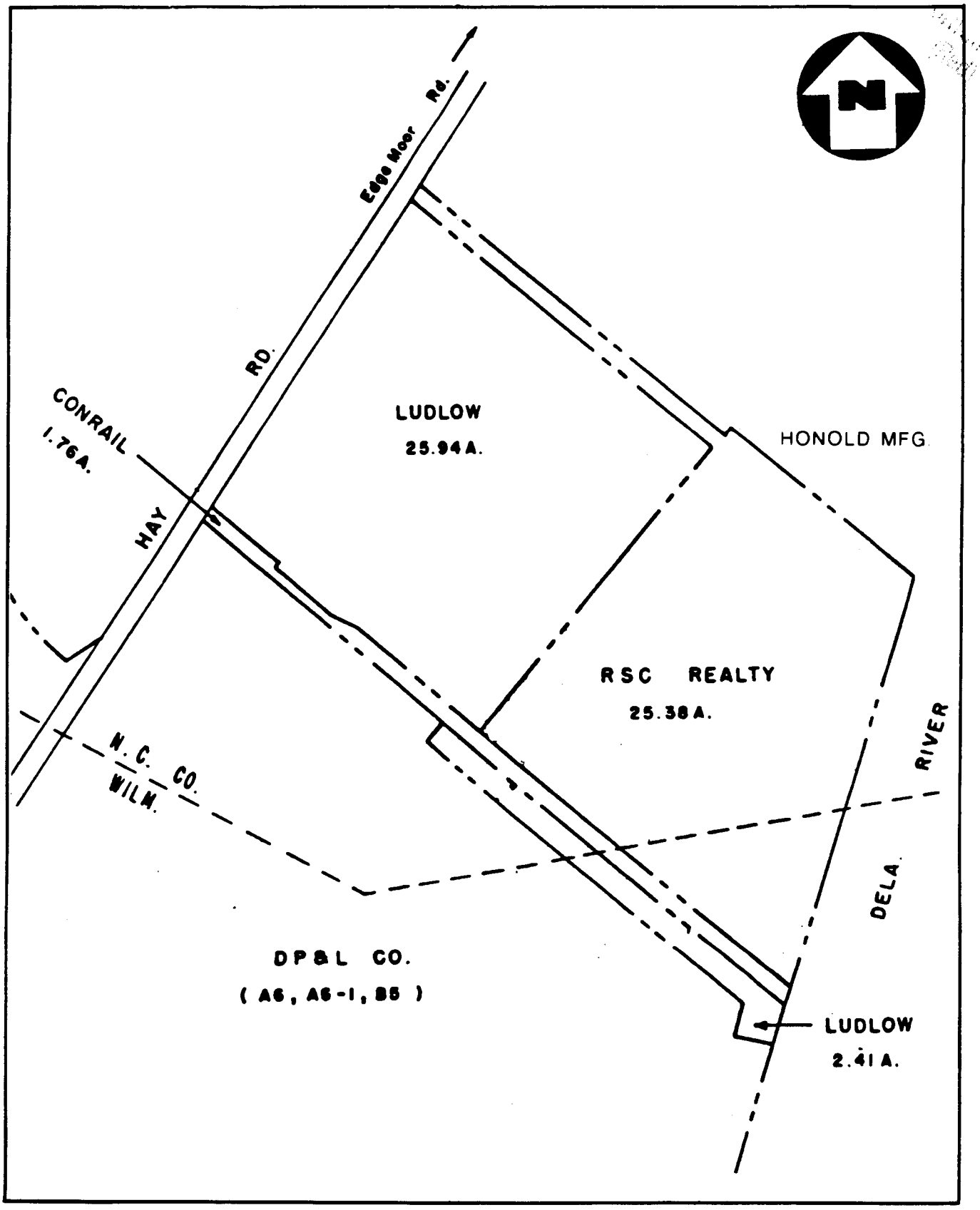


FIGURE 2

SITE SKETCH

LUDLOW INDUSTRIAL PARK DRUM SITE

(NO SCALE)

NUS CORPORATION